



Smithsonian

# PREDATORS AND PREY



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# The Hunter and the Hunted

A lion slinks through the tall grasses in an African savanna. Today, the lion is hunting a distant warthog. The warthog is quick, but it is no match for the lion's speed. The lion sprints toward the warthog and pounces. In an instant, the lion sinks its claws into the warthog's thick, hairy hide and delivers a final bite to the warthog's neck.

Predators, like this lion, are animals that hunt and eat other animals. The animals they pursue, like this warthog, are their prey. Predators and prey exist all around the world. They come in many shapes, colors, and sizes. They all have different abilities, features, and behaviors that help them survive.



Lions typically stalk their prey from a covered position before chasing them down.

In every ecosystem, there is a balance of predators and prey. Ecosystems are made up of the living and nonliving parts of an environment. Living things include **organisms**, such as plants, animals, and fungi. Nonliving things include sunlight, soil, and water sources. These parts are all connected. Diagrams called *food chains* show how predators and prey get the energy they need to survive.

Predators and prey are important in each ecosystem around the world. Exploring how predators and prey live and behave in different environments provides insight into how most animals function.

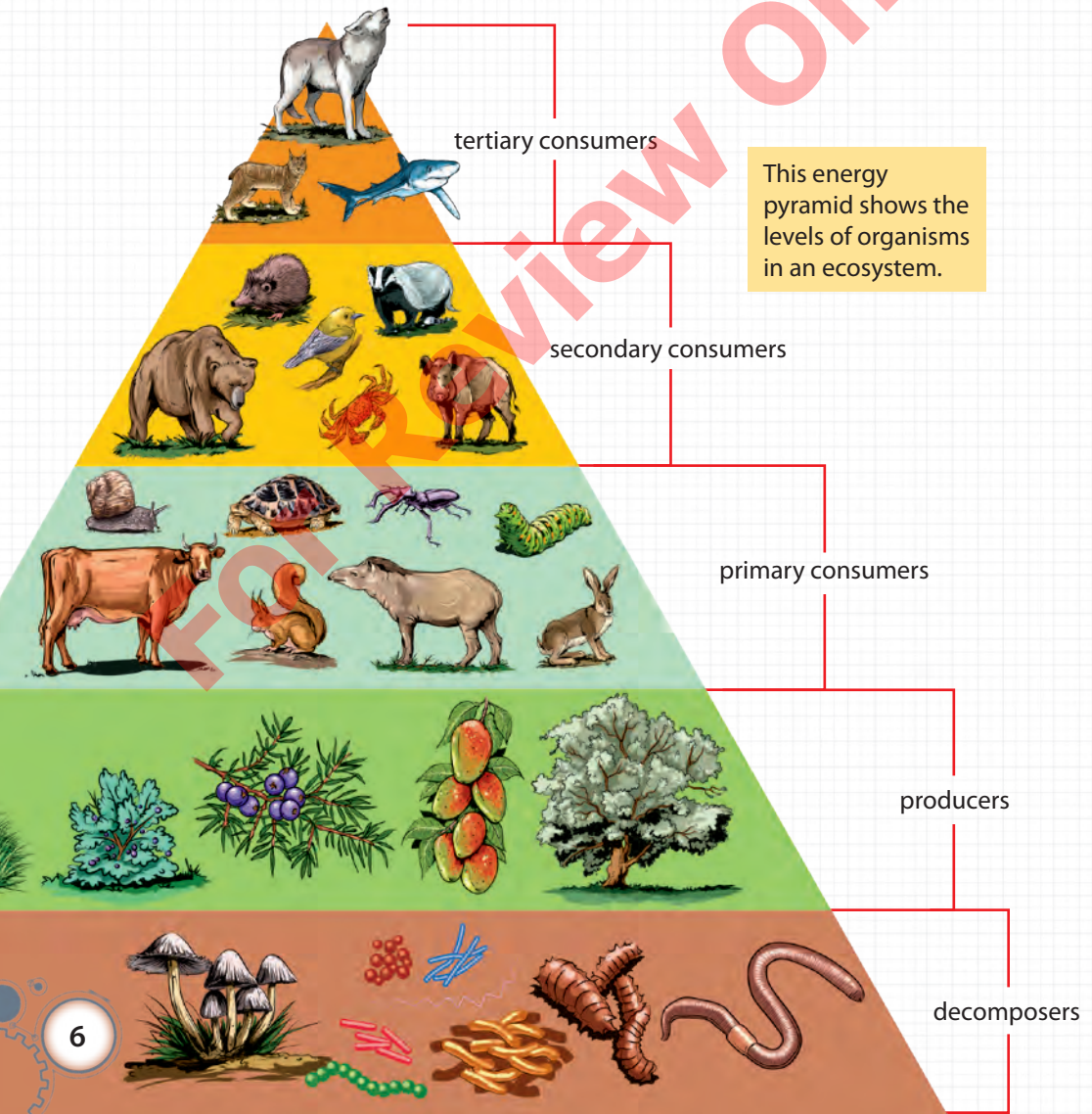


What do spiders, frogs, and grizzly bears have in common? They are all predators!



# Delicate Balancing Act

Ecosystems are built on a complex web of relationships. Producers, consumers, and decomposers make up the living things in an ecosystem. Producers are plants, and they make their own food. Consumers eat plants, animals, or both. Predators and prey fall into this group. Decomposers break down dead animals and plants and return their **nutrients** to the soil. These three groups function together in a delicate balance.



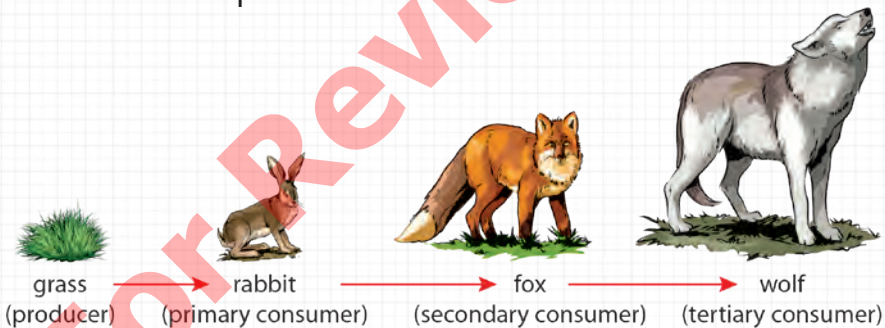
# Caught in the Food Chain

A food chain shows how living things depend on one another for food. Arrows show the connections between predators and their prey. All predators and prey are consumers. There are three different types of consumers.

First, there are primary consumers. These animals only eat plant matter, and they are called *herbivores*. Elk, rabbits, and voles are primary consumers. They are all prey.

Secondary consumers are next. These animals can be herbivores or omnivores. They might eat only plants, or both plants and animals. Certain birds, raccoons, and foxes are secondary consumers. These animals can be both predators and prey.

Tertiary consumers are the last type of consumer. These animals are always at the highest level of a food chain. In most cases, they are carnivores who only eat meat. These animals are all predators.



## FUN FACT

When a consumer has killed an animal and eaten their fill, other consumers may feast on the **carcass**. These consumers are called *scavengers*. They pick the bones clean before decomposers come along. Vultures are well-known scavengers.



## Breaking the Balance

Both the living and nonliving parts of an ecosystem are **interdependent**. When something changes, it affects all other parts of the ecosystem—sometimes in negative ways. These effects then ripple through a food chain.

A prime example of this occurred when gray wolves disappeared from Yellowstone National Park. By 1926, the park had zero gray wolves due to overhunting. No one expected the consequences that followed.

First, the park's elk population flourished. This might sound like a good thing, but it caused an imbalance. While grizzly bears and coyotes also ate elk, gray wolves were their main predators. The wolves had been keeping the elk population in check. Next, elk began to eat all the willow, aspen, and cottonwood trees. Elk ate the trees faster than they could grow. For many years, these trees had trouble growing beyond saplings. As a consequence, once the elk dominated, beavers were left with hardly any saplings. This was an important food source for them, and their population suffered.



During hunting, a wolf pack spreads out to surround its prey.



Over time, scientists realized they had to bring back gray wolves. So, in 1995, they reintroduced gray wolves into the park. The population started small, and it grew to more than 100 over the next two decades. Now, a more natural balance among animals and plant life has been restored.



On average, elk eat 9 kilograms (20 pounds) of plant material a day!

## Bringing Back the Bison

Like gray wolves, bison were hunted in Yellowstone National Park. The National Park Service estimates that there were roughly two dozen bison left in 1902. With lots of hard work over many decades, their numbers increased again. As of 2022, park staff counted around 5,900 bison.



# STEAM CHALLENGE

## Define the Problem

Spiders, like engineers, design and build complex structures called *webs* to trap and collect their prey. Can you think like an arachnid to create an amazing and effective web to help maintain balance in an ecosystem? Your task is to design and build a model web that is able to trap and hold three different plastic insects within the web.



**Constraints:** You may only use the materials provided to you. Your web must be at least 25 centimeters (10 inches) across.



**Criteria:** The web must be able to be held upright. It must be able to trap and hold three different insects.



# CAREER ADVICE

from Smithsonian

## Do you dream of working with animals?

Here are some tips  
to keep in mind for the future.

"Volunteer and intern with animals. Many places (such as zoos and aquariums) look for people who have hands-on experience handling and caring for animals. Some of my colleagues started their animal experience by volunteering at local animal shelters in their area."

– Bayley McKeon, *Ocean Education Specialist,  
Smithsonian National Museum of Natural History*

"If you want to study animals, translate your curiosity into adventurousness and be open to diving in wherever you see professionals already at work. Aquariums, zoos, sanctuaries, and conservation groups in your area are all great places to build the connections that can help you grow a career."

– Alia Payne, *Ocean Education Specialist,  
Smithsonian National Museum of Natural History*



# Read and Respond

1. What roles do producers, consumers, and decomposers play in an ecosystem?
2. Describe two or three examples of how prey protect themselves from predators.
3. Describe two or three examples of how predators use special methods to hunt prey.
4. What is the difference between camouflage and mimicry?
5. Compare and contrast poisonous animals with venomous animals.
6. What can happen when there is an imbalance of predators and prey in an ecosystem?

